MI-09303A
GEK-61251A
Supersedes GEK-36086
and GEK-35918

INSTRUCTIONS

# FUEL OIL SYSTEM FOR EXPORT LOCOMOTIVES

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## DESCRIPTION

The engine fuel supply is contained in a fuel tank located below the locomotive platform. Fuel is drawn from the tank by the electric-driven fuel-transfer pump and is circulated through the system (Fig. 1).

The fuel system consists of the following components, listed in order of fuel flow from the fuel tank through the system:

1. Fuel tank
2. Single-element fuel strainer
3. Fuel-transfer pump
4. Relief valve
5. Filter
6. Engine fuel headers
7. Injection equipment
8. Regulating valve
9. Fuel drain headers.

*Revisions are indicated by marginal bars.

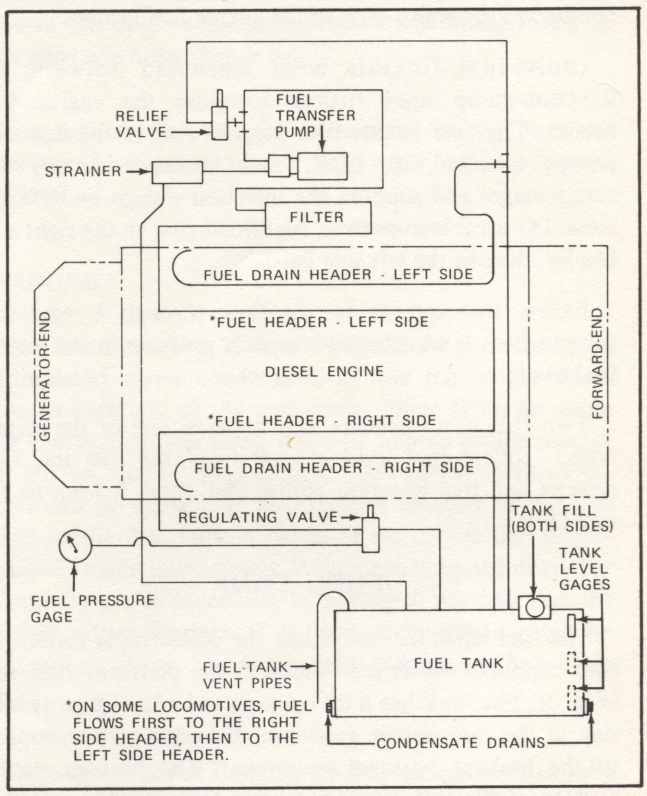


FIG. 1. TYPICAL FUEL OIL SYSTEM — SCHEMATIC DIAGRAM.

FIG. 1, E-21673

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

**Verify numbers for parts, tools, or material by using the Renewal Parts or Tool Catalogs, or contact your General Electric representative for assistance. Do not order from this publication.**

GENERAL ELECTRIC

The suction side of the system is between the tank and the fuel-transfer pump. Fuel is drawn through a single-element fuel strainer before reaching the pump.

The pressure side of the system is located between the transfer pump and the pressure-regulating valve which discharges excess fuel back to the tank. Fuel discharged by the transfer pump flows to a single-element fuel filter. A relief valve also is connected to the pump discharge and protects the transfer pump from overloads caused by flow restrictions in the pressure side of the system. Fuel then is conducted through a pipe to the engine fuel header.

Individual flexible hoses connected between the injection-pump inlet fittings comprise the engine fuel header. The fuel header first supplies fuel to the injection pumps on the left bank, then crosses over by the turbocharger and supplies the injection pumps on the right bank. On some locomotives, fuel flows first to the right side header, then to the left side header.

Excess fuel returns to the tank through a regulating valve, which is adjusted to maintain pressure in the engine fuel header.

Two fuel drain headers, one on each side of the engine frame, collect fuel leaking back from the fuel injection nozzles and fuel injection pumps and direct it back to the fuel tank.

## FUEL TANK

The fuel tank, located below the platform, is carried by four supports which are welded to the platform main sills (Fig. 2). The tank has a fill opening and a level gage at each side of the locomotive. Fuel-level dial gages may be applied to the tank as optional equipment. The bottom, center portion of the tank serves as a sump for collecting sediment and condensate. A captive bolt-type valve (plug assembly), at each end of the tank, allows drainage of any accumulated sediment and condensate. Two vent pipes, connected to atmosphere, prevent the tank from becoming air-bound.

### REMOVAL

1. Disconnect and remove the vent pipes.

2. At the unions above the fuel tank disconnect:

   a. The fuel suction line

   b. The fuel return line

   c. The two header drain lines.

   Cover all pipe openings to prevent entry of dirt into the system.

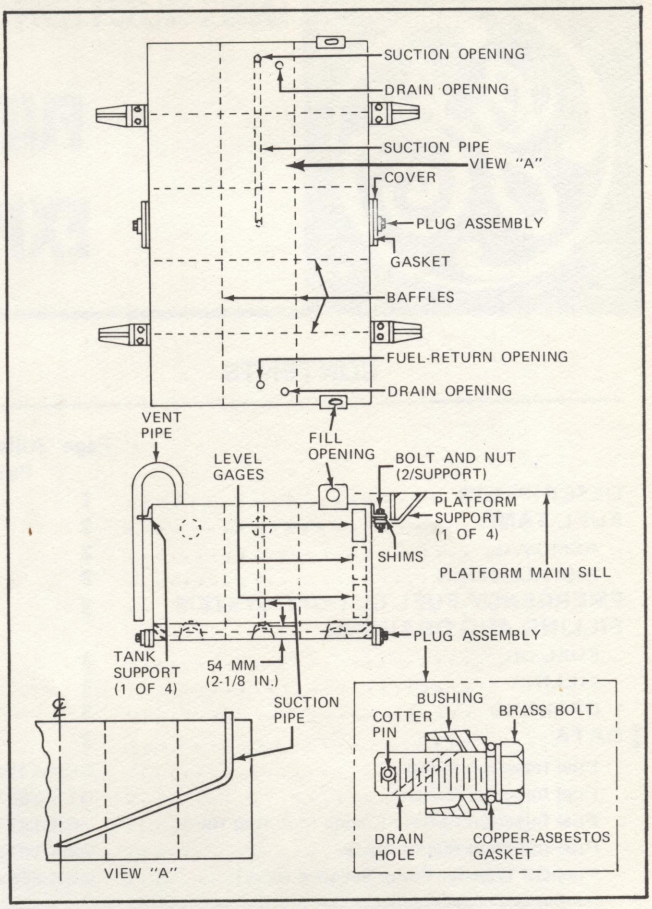


FIG. 2, E-21674

FIG. 2. TYPICAL FUEL TANK ASSEMBLY.

3. Remove the eight bolts and nuts securing the tank supports to the platform supports.

4. Remove the tank from the locomotive. Retain all shims used between the tank supports and the platform supports.

### INSTALLATION

When installing the tank, it is mandatory the platform be supported in its NORMAL manner; i.e., at the two center bearings. When this condition is satisfied, and the instructions below followed, the stresses in the tank and in the platform will be minimized.

1. Position the tank under the platform with the four tank supports resting on the four platform supports.

2. Temporarily install the shims that were previously installed between the tank supports and platform supports.

3. Before installing any bolts and nuts, check the clearance between each tank support and its associated platform support. Maximum clearance permitted is 0,25 mm (0.010 in.). Adjust shim thickness at appropriate supports to achieve this clearance.

4. Install the eight bolts and nuts to secure the tank to the platform supports. Apply Lubriplate* Spray Lube "A," Part 147X1614, to bolt threads and torque to values given in DATA section.

5. Connect the four fuel lines at the unions above the fuel tank. Apply Scotch** No. 48 tape to pipe threads when making these connections.

6. Install the vent pipes and secure with clamps at front of tank.

## EMERGENCY FUEL CUT-OFF SYSTEM

The emergency fuel cut-off system can be activated by:

a. Depressing the button on the emergency fuel cut-off switch located under the left side of the platform.

b. Depressing the button on the emergency fuel cut-off switch located under the right side of the platform.

c. Moving the engine control switch, located in the operating cab, to the STOP position.

Momentarily depressing either of the switch buttons, or moving the EC switch to STOP, will cause the fuel transfer pump to stop, thus stopping the flow of fuel to the engine. At the same time, a signal to the governor causes the governor to move all fuel injection pumps to the engine-stopped position. Once tripped, the system is restored to normal by following the normal starting procedure.

## FILLING AND DRAINING

### FUEL OIL

The fuel oil recommended for the engine is distilled fuel. It should conform to the American Society for Testing Materials (ASTM) Specification D-975 No. 2-D. For extreme low temperatures, or for engines operating at high altitudes, Number 1D fuel with a minimum cetane value of 45 may be used. For further information, see Fuel and Lubricant Specifications Instructions.

*Product of Fiske Bros. Refining Co.
**Product of Minnesota Mining & Mfg. Co.

### FILLING

Fuel filling may be done from either side of the locomotive, by applying the fuel hose to the fill opening. Observe the upper sight gage periodically during filling to determine when the tank is full.

The fuel supply may be determined at any time by observing the upper and lower sight gages for the indicated fuel level.

### DRAINING

The fuel tank (Fig. 2) should be drained periodically of accumulated water condensate, by the use of the drain valves at each end of the tank sump. These valves are made with a straight-thread screw which contains a drilled passage and has an internal stop to limit the number of turns the valves can be opened. If an excessive amount of water is found in the fuel tank, a check of the engine fuel supply should be made immediately. Also check the possibility that leakage from a cylinder may be getting to the tank through the fuel return headers. If water is permitted to enter the fuel system, it can cause extensive damage to the system parts.

Large quantities of fuel may be drained quickly from the tank by removing the drain bushing from each end of the tank sumps. The sump end-covers may be removed to gain access to the tank when internal cleaning becomes necessary.

## DATA

### TORQUE VALUES FOR MEDIUM CARBON BOLTS

| Thread | Torque Value | |
|---|---|---|
| | Lb.-Ft. | N·m |
| 3/4 in.-10 | 185-205 | 251-278 |
| 7/8 in.-9 | 300-330 | 407-447 |
| 1 in.-8 | 440-490 | 597-664 |
| 1 1/4 in.-7 | 890-990 | 1206-1342 |
| 1 1/2 in.-6 | 1570-1740 | 2129-2359 |